Pain management in developing countries

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Summary
Access to pain relief is an integral part of peri-operative care jointly managed by clinicians and nursing staff. Simple regimens, relying on inexpensive drugs, are often not followed due to inadequate healthcare systems. This article describes some of the common challenges, and suggests practical approaches to overcoming them.

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The highest attainable standard of health is enshrined in the 1948 Universal Declaration of Human Rights as a fundamental right of every human being [1]. Relief from pain is part of that basic human right to health [2].

Pain is a presenting feature of many conditions and complicates peri-operative care following major surgery. Apart from the obvious humanitarian issues in relieving suffering from pain, poor peri-operative analgesia leads to immobility and prolonged recovery, and may increase cardiovascular, respiratory and gastro-intestinal complications [3]. Unrelieved acute pain may lead to chronic pain conditions. Risk factors that predispose to the development of long-term post surgical pain include the severity of pre- and postoperative pain, intra-operative nerve injury and psychological vulnerability. Progress in acute pain management over the last 30 years has demonstrated that effective pain relief can be achieved with a range of inexpensive drugs and treatments, yet the vast majority of patients in less developed areas of the world have little or no access to even the most limited of therapies that could alleviate their suffering from acute or chronic pain.

This article will concentrate on some of the major causes of acute pain in the developing world, the problems of accessing analgesia, and some possible practical solutions for peri-operative practice. It will also include a consideration of chronic pain and its management in the developing world.

Causes of acute pain in the developing world

The World Health Organization (WHO) produces data on the global burden of disease, leading causes of death, life expectancy, adult and child mortality risks, but no data on the quality of health care or measures of suffering, including that from acute pain. Studies from the developing world that focus on pain tend to come from the better-resourced centres and are unlikely to represent the situation in rural clinics, where conditions are largely unreported but may be expected to be considerably worse. When war and political instability are present, access to any health care – let alone analgesia – may be difficult or even impossible.

Trauma has been described by the WHO as a hidden epidemic. Road traffic accidents, violence and self-inflicted injury are among the top 10 leading causes of death and ongoing morbidity in low to middle income countries and, in some developing countries, account for one-third of the disease burden in male adults between 15 and 44 years of age [4]. A study from a teaching hospital in Nigeria suggested that analgesia for this group of patients is often non-existent or poor. Only half of the patients in pain in the emergency department received any analgesia and, of those who received analgesia, 80% were still left with moderate to severe residual pain [5].

Obstetric services in the developing world are poorly developed; 99% of all maternal deaths occur in the developing world and obstetric fistula from prolonged...
obstructed labour is commonplace [6]. The lack of obstetric services results in unmeasured suffering of mothers, most of whom have no access to basic medical care, let alone analgesia. A study from the teaching hospital in Benin City, Nigeria, found that 85% of women would request analgesia in labour if it were available. However, only 40% of women received any analgesic intervention [7]. The situation in many rural hospitals is likely to be that no analgesia is available to women with either normal or complicated labours.

Rates of surgical pathology in the developed world are difficult to quantify. Fewer major and minor operations are carried out when compared to industrialised countries. In sub-Saharan Africa there are an estimated 70–500 operations per 100 000 population, compared with 5000–9000 per 100 000 in high income, industrialised countries [8]. The most common major operations in sub-Saharan Africa are Caesarean section, exploratory laparotomy, eye/lens removal and hernia repair [9]. The most common minor operations are tooth extraction, wound suture, incision and drainage of abscess and closed reduction of fracture [8]. What these statistics illustrate is the gap in provision of surgical services; large numbers of patients present late with untreated pathology with unnecessary complications. A high proportion of patients undergo emergency surgery and postoperative pain relief is often inadequate. A study of postoperative pain in Nigeria showed that two-thirds of patients complained of moderate to unbearable pain 24 h postoperatively [10]. In many places opioid analgesia is unavailable intra-operatively and postoperatively. A survey of anaesthetic officers in Uganda showed that only 45% always had either pethidine or morphine available; 21% never had these drugs available [11].

Why are things so difficult in developing countries?

It appears that analgesia has a lower priority than other aspects of healthcare in developing countries so that effective pain relief is unavailable to large numbers of patients. Comprehensive data about the incidence and management of pain are lacking, but it is clear that, even when patients do access health care facilities, pain relief still seems to be poor.

The developing world encompasses a spectrum of countries with wide differences in population, geography, politics and culture. They are primarily united by a general lack of capital resources. Problems in accessing analgesia are diverse and vary from region to region, although common themes can be recognised.

Population and geography

Part of the problem is in delivering effective healthcare to rural populations of subsistence farmers, served by poor road networks with non-existent public transport. Frequently, health care is delivered by a network of small clinics – some without a doctor – serving massive populations of patients over wide geographical areas. Although better facilities may exist in the cities, treatment there may be costly and unaffordable by the vast majority of the population.

Healthcare resources

Healthcare systems are often poorly developed. The provision of anaesthesia and analgesia is seen as a low priority in comparison with the treatment of diseases such as malaria, tuberculosis and HIV/AIDS. Basic resources such as reliable running water and electricity may not be available [11], so it is not surprising that the provision of anaesthesia drugs, including analgesics, is problematic. Although lack of finance is a significant barrier to improving this situation, better management and infrastructure are also required.

Administration of available drugs may not happen appropriately. Doctors or anaesthetic officers often receive little training in analgesic management. In a rural hospital in sub-Saharan Africa, it is not uncommon to have two nursing staff looking after a ward of 50 patients; the overstretched nursing staff may be unavailable to administer analgesic drugs and, indeed, the safety of potent analgesics in this setting has to be questioned. Lack of training may lead to unreasonable fear of side-effects or addiction, which may propagate a culture of non-intervention. Staff can become so used to doing nothing for patients in pain that non-treatment becomes the norm. There is a danger that patients begin to believe that nothing can be done, or adopt a fatalistic attitude and suffer in silence. Patients expect pain as an inevitable part of the surgical intervention and despite the high incidence of reported pain may still rate ‘pain relief’ as satisfactory! [12].

Opioids

Opioid analgesics are the gold standard for treating moderate to severe pain, drugs such as morphine being low cost and highly effective. However, the availability and use of opioids is not uniform across the globe. In 1999, 87% of the world’s morphine was consumed by 10 major industrial countries: Australia, Canada, Denmark, France, Germany, Japan, Spain, Sweden, the UK and the USA; 85% of the world’s population shared the remaining 13% of the world’s morphine [13].

There are many barriers to opioid use in the developing world. There may be concerns at government level over
risks of addiction and abuse. Import restrictions may be overly stringent and the laws regarding prescribing and dispensing opioids can make it virtually impossible to get opioids to the patients. Of the governments that responded to the International Narcotics Control Board survey, 43% said that they require physicians to report to the government those patients who are prescribed opioid analgesics; this acts as a powerful disincentive to prescribe opioids [13].

Currently, the cost of importing morphine to developing countries is disproportionately high. A survey of opioid costs in 2003 showed that opioid drugs were up to 10 times more expensive in the developing world than in the developed world, after adjustment for differences in gross domestic product [14].

Opioid legislation can have a massive effect on opioid consumption. In India the introduction of a piece of legislation that resulted in a significant increase in the bureaucracy associated with purchasing opioids led to a 97% fall in consumption of morphine from 716 kg in 1985 to 18 kg in 1997 [15]. The WHO estimates that if barriers to accessing morphine in the developing world could be removed, then a reasonable estimate of the cost of morphine would be one US cent per milligram [16].

What treatments are practical?

Due to the diversity of situations and problems encountered in the developing world there can be no single set of solutions that can be applied globally. However, there are basic interventions that we know are effective; improvements in acute pain management are most likely to result from effective training programmes, use of multimodal analgesia and access to reliable drug supplies.

Pain assessment

Education and motivation of different staff groups to assess and treat pain according to local protocols is the most important part of the process.

In an ideal world, assessment of pain should become as basic an observation as measuring pulse and blood pressure. Pain intensity has been described as the ‘fifth vital sign’ [17]. Assessment tools are simple to use and understand and it would be hoped that such an approach would be feasible, despite the shortage of nursing staff on the wards. Pain measurements can be adapted to local circumstances [18, 19].

Therapeutic interventions

Psychological interventions

Training programmes should encourage discussion of pain management as part of the routine care of the patient. A simple explanation of the cause and likely duration of pain can dramatically improve a patient’s ability to cope, even when other interventions may be difficult to provide. Patients may have a limited understanding of their condition and assume that pain may not be self limiting or treatable.

Drug treatment

The benefits of techniques such as patient-controlled analgesia have been demonstrated in the developed world, but the lack of equipment and the need for careful ward monitoring of these devices mean that in developing countries their use is impracticable and unsafe. However, administration of effective analgesia does not depend on sophisticated technology [20].

The WHO analgesic ladder outlines simple techniques using minimal resources to combat cancer pain [21]. This model has been applied to acute pain by the World Federation of Societies of Anaesthesiologists (WFSA), which has produced a modified ladder for acute pain (Fig. 1) [22]. Starting with strong parenteral opioids, ketamine and/or local anaesthetic, there is then a step down to oral opioids and finally to non-steroidal anti-inflammatory drugs and paracetamol on its own. All of these drugs appear on the WHO list of essential drugs [23]. This ladder should be coupled with multimodal analgesia techniques including local anaesthesia blocks, and prescribing regular analgesics with additional analgesics for breakthrough pain. Ideally, the oral route should be used for postoperative analgesia, including the use of oral morphine when available and feasible.

Simple analgesics such as paracetamol, ibuprofen and diclofenac are cheap and readily available in most countries of the world. However, access to drug supplies may be variable within the hospital; a common solution is to pre-prescribe analgesics to be purchased by patients or relatives from local pharmacies prior to elective surgery.

Ketamine is the mainstay of anaesthesia in many parts of the developing world, particularly for children. It is also an effective analgesic that can be used to provide
immediate postoperative analgesia. It is particularly potent in combination with parenteral opioids, where it has a significant opioid-sparing effect.

Opioid use should be encouraged where possible, but this must include introduction of effective systems for opioid administration – reliable systems for purchase, safe storage, recording of use and training regarding effects and side-effects. This has been achieved in Nigeria through several years of advocacy for availability of opioid analgesics at central Government supply level, public enlightenment and education (undergraduate, postgraduate and health professionals) on pain management and safe use of opioid analgesics [24].

Local anaesthetics
Local anaesthetic techniques can provide excellent postoperative pain relief and their use should be encouraged whenever possible, by whichever route possible, even if only by local infiltration. Limited postoperative facilities and equipment shortages limit some of the more advanced options (epidurals and continuous plexus blockade), but simple techniques are underutilised and have a low incidence of adverse effects.

Single shot techniques including spinal anaesthesia, plexus blockade, caudal anaesthesia in children, and infiltration of local anaesthetic into wounds can be accomplished with minimal resources but great effectiveness. These techniques work most effectively using bupivacaine if it is available, but the use of shorter acting drugs such as lidocaine with adrenaline is also effective. The use of caudal additives such as ketamine and clonidine should be encouraged, if available, but it is important to avoid additives with preservatives. Both surgeons and anaesthetists need training to develop the use of these straightforward techniques.

Training in pain management
As clinicians we cannot hope to influence the geography or politics of a developing country and we can do little to reverse under-funding, poor resources, inadequate management and problems such as corruption. However, by training practising healthcare providers and raising awareness of the problem of pain and analgesia provision both locally and internationally, we can begin to change practices and expectations.

Many anaesthesia providers do not own an anaesthesia textbook [11]. Publications such as Update in Anaesthesia and the Tutorial of the Week published by the World Anaesthesia Society show how simple, cost-effective, practical information can be made available to isolated anaesthesia providers in the developing world, both in hard copy and on the internet [25]. A superb publication, Acute Pain Management: Scientific Evidence, can be accessed through the Australian and New Zealand College of Anaesthetists (ANZCA) website [3].

Chronic pain problems
Pain that persists beyond the point that it serves as an indicator of tissue damage (usually 3–6 months) is considered chronic. In developing countries, chronic pain can result from acute disorders such as trauma, surgery, infections (including tuberculosis and leprosy) that leave residual tissue damage. Chronic pain can also be the consequence of progressive diseases such as cancer, arthritis, sickle cell disease, HIV/AIDS, degenerative changes in joints, neurological diseases and terminal illnesses. Chronic pain constitutes a health burden to patients and their families. Low back pain, for example, is prevalent even in rural income communities and may occur at levels similar to those reported in high income countries [26]. In a collaborative study conducted across 15 countries, pain was a commonly reported problem among primary care patients and was consistently associated with psychosocial illness across centres in Asia, Africa, Europe and the Americas [27].

Worldwide, chronic pain management requires pharmacological and non-pharmacological therapies with attention to other needs of the patient (psychosocial and spiritual). In Nigeria, a pain clinic was first established at the University College hospital, Ibadan, by the Department of Anaesthesia in 1979 [28] but the clinic failed to survive the period of specialist medical manpower exodus in the country in the late 1980s. The clinic was re-established by a multidisciplinary group as a Pain–Palliative Care Clinic in 2005 to cater for cancer and non-cancer pain. The analgesics available were mainly non-opioids until recently, when opioids including oral morphine solution have become available and used for cancer patients. The morphine is prepared from imported powder at the hospital pharmacy. Physical and psychological therapies are also offered by the multidisciplinary team.

A major challenge is that patients expect to be cured and default after a few attendances. The dearth of pain specialists and specialised pain clinics along with the lack of knowledge among the public and health professionals constitute major impediments to chronic pain services in developing countries [29].
Encouraging links between developed and developing countries (for example by linking anaesthetic departments) can lead to the sharing of ideas and problems, and exchange of visits of personnel, and may even help with the supply of essential equipment and drugs.

Refresher courses provide invaluable opportunities to share ideas about analgesia and can reach a large number of staff. Material can be made appropriate for the level of resources found in the country, local protocols developed, and expertise can be brought to bear on particular problems.

On a cautionary note, care should be taken to ensure that training programmes are relevant to the problems that are encountered in everyday practice. For instance, it is important to consider several of the side-effects of different drugs, especially in shocked patients. Intramuscular opioids should be used carefully in such patients (it is preferable to titrate intravenous opioids) and trainers should be aware of the limitations of monitoring in ward areas. Non-steroidal anti-inflammatory drugs (NSAIDs) such as diclofenac should be avoided in hypotensive or hypovolaemic patients, particularly in a setting where iatrogenic renal failure will be a fatal complication.

Although classroom teaching can improve knowledge, the best way of improving practice is to be taught in theatre by a physician anaesthetist. As well as providing personal attention and mentorship, it allows anaesthetists to act as role models and to stress the effectiveness of basic techniques and the importance of patient safety. In addition, it may help to recruit young doctors into a career in anaesthesia. Training the local trainers and adding to the anaesthesia workforce are important steps on the route to sustainability in developing countries.

Conclusion

The lack of analgesia in the developing world is but one of a vast number of problems facing these regions. The International Society for the Study of Pain has recognised this and is collaborating with the WHO both to highlight the problem and to try to encourage solutions [30]. As anaesthetists, we have the knowledge and skills to help in these areas. Hopefully with our combined actions the situation can be improved so that patients do not suffer needlessly from acute pain.

References


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